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2123	10

DATE MAILED: 10/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/268,999	Applicant(s) ARITA, YUICHI	
	Examiner Kandasamy Thangavelu	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 11-28* is/are rejected.

7)☒ Claim(s) *9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Introduction

1. This communication is in response to the Applicant's Amendment mailed on July 10, 2002. Claims 1, 7, 11, 13 and 22-28 were amended. Claims 1-28 are pending.

Response to Arguments

2. Applicant's arguments filed June 11, 2002 with respect to claim rejections under 35 U.S.C. 112 first paragraph, under 35 U.S.C. 102 (b) and under 35 U.S.C. 103 (a) have been fully considered. The claim rejections under 35 U.S.C. 112 first paragraph are withdrawn with respect to work means model, workability coefficient evaluation, manipulator model, manipulation requirements and manipulation model based on the amendment. However, claim rejections under 35 U.S.C. 112 first paragraph with respect to workability evaluation are maintained. Additional rejections have been made under 35 U.S.C. 112 first paragraph and second paragraph.

The arguments with respect to claim rejections under 35 U.S.C. 102 (b) and under 35 U.S.C. 103 (a) are moot in view of the new ground(s) of rejection which are applied against the amended claims. The applicant's amendments necessitated the new grounds of rejection. Therefore, this office action is made final.

Foreign Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on Japanese patent Application 10-072900 filed on March 20, 1998. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. The drawings submitted on March 16, 1999 are accepted.

Claim Objections

5. The following is a quotation of 37 C.F.R § 1.75 (d)(1):

> The claim or claims must conform to the invention as set forth in the remainder of the specification and terms and phrases in the claims must find clear support or antecedent basis in the description so that the meaning of the terms in the claims may be ascertainable by reference to the description.

6. Claim 1 is objected to because of the following informalities:

Amended Claim 1, Line 4, "working for the standard part models" is incorrect. It should be "working of the standard part models".

Amended Claim 1, Para 4, Line 1, "working for the standard part models" is incorrect. It should be "working of the standard part models".

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 7 and 11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejections are based on the determination that the specification does not define workability and does not explain how the workability is evaluated, but merely states "evaluating a workability of the working means model" and "evaluating a workability for each of the operation methods of the working means model". The specification also does not explain how workability is evaluated based on a result of execution of the working simulation and based on the workability evaluation coefficient.

9. Claims 24-28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejections are based on the determination that the specification does not define or describe main model, workable component model, working model and component model, which are used in these claims. The relationship among these models and how they are related to standard parts model and working means model are also not described in the specification nor displayed in any figure.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23, Paragraph 3, Line 1 states "said design supporting means". There is insufficient antecedent basis for this limitation in the claim. Paragraph 2, Line 1 states "design supporting section".

12. Claims 7 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7 and 11 refer to workability and workability evaluation coefficient. Without proper definition of workability and workability evaluation coefficient and how workabilty is evaluated using workability evaluation coefficient and the result of execution of the working simulation, it not possible to determine what the applicant is claiming as his invention.

13. Claims 24-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 24-28 refer to main model, workable component model, working model and component model. Without proper explanation of these models and their relationship to the working means model and standard parts model, it not possible to determine what the applicant is claiming as his invention.

Claim Interpretations

14. The claims are interpreted using the following interpretations of the claim language:

Amended Claim 1, Line 4, "working for the standard part models" is interpreted as "working of the standard part models".

Amended Claim 1, Para 4, Line 1, "working for the standard part models" is interpreted as "working of the standard part models".

Amended Claim 23, Paragraph 3, Line 1 is interpreted as "said design supporting section".

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

16. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. Claims 1-5, 8, 12-18 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Goto et al. (GO)** (U.S. Patent 5,075,866) in view of **Siddique (SI)** (Thesis to The Academic faculty for Master of Science in Mechanical Engineering, Georgia Institute of Technology, May 1996).

17.1 **GO** teaches Apparatus for automatically designing jig. Specifically, as per Claim 1, **GO** teaches a simulation apparatus for simulating working [for] of the standard part models arranged in the design model (Fig.14; Fig. 16D; Col 1, Lines 6-16);

based on design information of a design model designed in a virtual three-dimensional space (Fig.14; Fig. 16D; Fig 15F;Col 4, Lines 23-24);

while one or more standard part models standardized in advance based on a specification model are arranged in the design model (Fig.2; Fig. 14; Col 4, Lines 24-28;, and Col 4, Lines 37-49).

GO does not expressly teach a working means model information storage section for storing working means model information which indicates details of a working means model to

be used in working on the one or more standard part models. **SI** teaches a working means model information storage section for storing working means model information which indicates details of a working means model to be used in working on the one or more standard part models (Page 117- Page120, Para 2), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included a working means model information storage section for storing working means model information which indicated details of a working means model to be used in working on the one or more standard part models, as that would allow the user's hands to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes and behavior of tools need to be modeled to facilitate the use by the designer.

GO does not expressly teach the working means model information being linked with standard part model information which indicates details of the one or more standard part models. **SI** teaches the working means model information being linked with standard part model information which indicates details of the one or more standard part models (Page 128, Fig. 6.9), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation

apparatus of **GO** with the simulation apparatus of **SI** that included the working means model information being linked with standard part model information which indicates details of the one or more standard part models, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach a working means model information extraction section for automatically referring, based on information regarding the standard part models arranged in a design model, to the working means model information storage section to extract information regarding a working means model to be used to work the standard part models arranged in the design model. **SI** teaches a working means model information extraction section for automatically referring, based on information regarding the standard part models arranged in a design model, to the working means model information storage section to extract information regarding a working means model to be used to work the standard part models arranged in the design model (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included a working means model information extraction section for automatically referring, based on information regarding the standard part models arranged in a design model, to the working means model information storage section to extract information regarding a working means model to be used to work the standard part models arranged in the design model, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach a working simulation execution section for executing a simulation of the working [for] of the standard part models with the working means model based on design information of the design model and the information regarding the working means model extracted by the working means model information extraction section. **SI** teaches a working simulation execution section for executing a simulation of the working [for] of the standard part models with the working means model based on design information of the design model and the information regarding the working means model extracted by the working means model information extraction section (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included a working simulation execution section for executing a simulation of the working [for] of the standard part models with the working means model based on design information of the design model and the information regarding the working means model extracted by the working means model information extraction section, as fastener accessibility could be determined to evaluate a design for ease of disassembly and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process.

17.2 As per Claim 2, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** does not expressly teach that the information regarding the standard part models arranged in the design

model include attribute information of the working means model related to the standard part models, and the working means model information extraction section refers to the working means model information storage section based on the attribute information to extract the information regarding the working means model. **SI** teaches that the information regarding the standard part models arranged in the design model include attribute information of the working means model related to the standard part models, and the working means model information extraction section refers to the working means model information storage section based on the attribute information to extract the information regarding the working means model (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the information regarding the standard part models arranged in the design model including attribute information of the working means model related to the standard part models, and the working means model information extraction section referring to the working means model information storage section based on the attribute information to extract the information regarding the working means model, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

17.3 As per Claim 3, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** does not expressly teach that the working means model information storage section stores information of one or more tool models which are models of actual tools and/or a hand model which is a model

of a hand of a worker as the information regarding the working means model. **SI** teaches that the working means model information storage section stores information of one or more tool models which are models of actual tools and/or a hand model which is a model of a hand of a worker as the information regarding the working means model (Page 117- Page120, Para 2), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the working means model information storage section storing information of one or more tool models which are models of actual tools and/or a hand model which is a model of a hand of a worker as the information regarding the working means model, as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes and behavior of tools need to be modeled to facilitate their use by the designer.

17.4 As per Claim 4, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** also teaches that the design information of the design model includes reference position information of the standard part models when the working means model works the standard part models (Fig. 16D, S144; Col 5, Lines 29-36).

GO does not expressly teach that the information regarding the working means model stored in the working means model information storage section includes reference position information of the working means model when the working means model works the standard part models. **SI** teaches that the information regarding the working means model stored in the working means model information storage section includes reference position information of the working means model when the working means model works the standard part models (Page 117, Para 2; Page 118, Para 2; Page 119 and 120), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2) and the hand and the tool need to be correctly positioned when they are brought near a fastener (Page 120, Para 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the information regarding the working means model stored in the working means model information storage section including reference position information of the working means model when the working means model worked the standard part models, as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes and behavior of tools need to be modeled to facilitate their use by the designer and the hand and the tool need to be correctly positioned when they are brought near a fastener.

GO does not expressly teach that the working simulation execution section performs a simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information of the working means model and the standard part models. **SI** teaches that the working simulation execution section performs a simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information of the working means model and the standard part models (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the working simulation execution section performing a simulation of a relationship in position/posture of the working means model to the standard part models based on the reference position information of the working means model and the standard part models, as fastener accessibility could be determined to evaluate a design for ease of disassembly and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process.

17.5 As per Claim 5, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** does not expressly teach the simulation apparatus comprising an interference checking section for checking interference of the working means model while the working simulation execution section executes a simulation of the standard part models working with the working means

model. **SI** teaches the simulation apparatus comprising an interference checking section for checking interference of the working means model (Page 123, Sec. 6.2.4; Page 124, Fig. 6.7 and Para 2) while the working simulation execution section executes a simulation of the standard part models working with the working means model (Page 122, Fig. 6.6), as fastener accessibility needs to be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of the product's disassemblability (Page 127, Sec. 6.3.1, Item 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included an interference checking section for checking interference of the working means model while the working simulation execution section executes a simulation of the standard part models working with the working means model, as fastener accessibility needed to be determined to evaluate a design for ease of disassembly and the information would allow evaluation of the product's disassemblability.

17.6 As per Claim 8, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** does not expressly teach that the working means model information storage section stores information regarding a working condition necessary for working for the working means model as information regarding the working means model. **SI** teaches that the working means model information storage section stores information regarding a working condition necessary for working for the working means model as information regarding the working means model (Page 117, Para 2, Lines 6-10; Page 118, Sec. 6.2.2; Page 119, Para 1), as information about the position of the hand is necessary to perform various activities (Page 117, Para 2) and

information about the location of the active end of the tool, the primary axes and the orientation of the local axes of the tool are required to imitate the function of the tools and to correctly position the tool in the hand (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the working means model information storage section storing information regarding a working condition necessary for working for the working means model as information regarding the working means model, as information about the position of the hand is necessary to perform various activities and information about the location of the active end of the tool, the primary axes and the orientation of the local axes of the tool are required to imitate the function of the tools and to correctly position the tool in the hand.

GO does not expressly teach that the working simulation execution section executes a working simulation based on the information regarding the working condition of the corresponding working means model stored in the working means model information storage section. **SI** teaches that the working simulation execution section executes a working simulation based on the information regarding the working condition of the corresponding working means model stored in the working means model information storage section (Page 120, Para 2 & 3), as fastener accessibility could be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the working simulation execution section executing a working simulation based on the information regarding

the working condition of the corresponding working means model stored in the working means model information storage section, fastener accessibility could be determined to evaluate a design for ease of disassembly and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process.

17.7 As per Claim 12, **GO** and **SI** teach the simulation apparatus of Claim 1. **GO** also teaches that at least one of a fastening part model, an adjustment part model and a connector part model is used for the standard part models (Figs. 6A and 6B).

17.8 As per Claim 13, **GO** teaches a simulation method for simulating, based on data regarding a design model displayed in a virtual three-dimensional space and designed (Fig.14; Fig. 16D; Fig 15F;Col 4, Lines 23-24);

while one or more standard part models standardized in advance based on a specification model are arranged in the design model (Fig.2; Fig. 14; Col 4, Lines 24-28 and Col 4, Lines 37-49);

standard part model information, which indicates details of the one or more standard part models (Fig.2; Fig. 14; Col 4, Lines 24-28;, and Col 4, Lines 37-49).

GO does not expressly teach a simulation method for simulating workability according to a working means model used to work the standard part models arranged in the design model. **SI** teaches a simulation method for simulating workability according to a working means model used to work the standard part models arranged in the design model (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design for ease of disassembly

(Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that included simulating workability according to a working means model used to work the standard part models arranged in the design model, as fastener accessibility could be determined to evaluate a design for ease of disassembly and the information would allow evaluation of a product's disassemblability and optimization of the disassembly process.

GO does not expressly teach the method comprising providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models. **SI** teaches the method comprising providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models (Page 117- Page120, Para 2), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that included the method comprising providing working means model information, which indicated details of a working means model to be used in working on the one or more standard part models, as that would allow the user's hands to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one

of the requirements in developing an environment for disassembly of virtual prototypes and behavior of tools need to be modeled to facilitate the use by the designer.

GO does not expressly teach the working means model information being linked with standard part model information. **SI** teaches the working means model information being linked with standard part model information (Page 128, Fig. 6.9), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that included the working means model information being linked with standard part model information which indicates details of the one or more standard part models, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach the method comprising automatically acquiring the working means model, which is to be used in working on the individual standard part model, based on the working means model information linked with the standard part model information that indicates the details of the last-named individual standard part model. **SI** teaches the method comprising automatically acquiring the working means model, which is to be used in working on the individual standard part model, based on the working means model information linked with the standard part model information that indicates the details of the last-named individual standard part model (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the

time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that included the method comprising automatically acquiring the working means model, which was to be used in working on the individual standard part model, based on the working means model information linked with the standard part model information that indicated the details of the last-named individual standard part model, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach the method comprising executing a simulation of working to be performed for the standard part models using the acquired working means model information and displaying a process of the execution of the simulation in a virtual three-dimensional space. **SI** teaches the method comprising executing a simulation of working to be performed for the standard part models using the acquired working means model information and displaying a process of the execution of the simulation in a virtual three-dimensional space (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that included executing a simulation of working to be performed for the standard part models using the acquired working means model information and displaying a process of the execution of the simulation in a virtual three-dimensional space, as fastener accessibility could be determined to evaluate a design for ease of disassembly and

the information would allow evaluation of a product's disassemblability and optimization of the disassembly process.

17.9 As per Claim 14, **GO** and **SI** teach the simulation method of Claim 13. **GO** also teaches that as the simulation of the working to be performed for the standard part models, a simulation of at least one kind of working from among assembling working, disassembling working, adjustment working and maintenance working for the standard part models is performed (Figs. 13E and 16D, Item S150).

17.10 As per Claim 15, **GO** and **SI** teach the simulation method of Claim 13. **GO** does not expressly teach that where a tool is used to work the standard part models, the tool and a hand of a worker who uses the tool are used as the working means model to perform the simulation of the working. **SI** teaches that where a tool is used to work the standard part models, the tool and a hand of a worker who uses the tool are used as the working means model to perform the simulation of the working (Page 117- Page120, Para 2), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided where a tool was used to work the standard part models, the tool and a hand of a worker who used the tool were used as the working means model to perform the

simulation of the working, as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes and the behavior of tools need to be modeled to facilitate their use by the designer.

17.11 As per Claim 16, **GO** and **SI** teach the simulation method of Claim 13. **GO** does not expressly teach that where the standard part models are to be worked by a hand of a worker itself, the hand of the worker is used as the working means model to perform the simulation of the working. **SI** teaches that where the standard part models are to be worked by a hand of a worker itself, the hand of the worker is used as the working means model to perform the simulation of the working (Page 142, Fig. 7.6, Items 4, 5, 9, 10, 11, 12 etc.), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided where the standard part models were to be worked by a hand of a worker itself, the hand of the worker was used as the working means model to perform the simulation of the working, as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment was one of the requirements in developing an environment for disassembly of virtual prototypes.

17.12 As per Claim 17, **GO** and **SI** teach the simulation method of Claim 15. **GO** does not expressly teach that when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space. **SI** teaches that when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space (Page 122, Fig. 6.6 and Sec 6.2.3), as from the simulation, the accessibility and relative difficulty of unfastening (fastening) can be determined by the designer (Page 123, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided for when the process of execution of the simulation of the working was displayed in the virtual three-dimensional space, the working means model was displayed in a shape suitable for an object of use in the virtual three-dimensional space, as from the simulation, the accessibility and relative difficulty of unfastening (fastening) could be determined by the designer.

17.13 As per Claim 18, **GO** and **SI** teach the simulation method of Claim 16. **GO** does not expressly teach that when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual three-dimensional space. **SI** teaches that when the process of execution of the simulation of the working is displayed in the virtual three-dimensional space, the working means model is displayed in a shape suitable for an object of use in the virtual

three-dimensional space (Page 122, Fig. 6.6 and Sec 6.2.3), as from the simulation, the accessibility and relative difficulty of unfastening (fastening) can be determined by the designer (Page 123, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided for when the process of execution of the simulation of the working was displayed in the virtual three-dimensional space, the working means model was displayed in a shape suitable for an object of use in the virtual three-dimensional space, as from the simulation, the accessibility and relative difficulty of unfastening (fastening) could be determined by the designer.

17.14 As per Claim 21, **GO** and **SI** teach the simulation method of Claim 13. **GO** does not expressly teach that when interference occurs with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference is displayed. **SI** teaches that when interference occurs with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference is displayed (Page 123-125, Sec 6.2.4 and Fig. 6.7), as interference checking is required to ensure that when moving around the virtual environment two bodies do not occupy the same space (Page 123, Para 3) and to help the user determine interference in virtual environment, the bounding boxes for each object are displayed (Page 125, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided for when

interference occurred with the working means model in a process of execution of the working to be performed for the standard part models with the working means model, an occurrence condition of the interference was displayed, as interference checking was required to ensure that when moving around the virtual environment two bodies did not occupy the same space and to help the user determine interference in virtual environment, the bounding boxes for each object could be displayed.

17.15 As per Claim 22, **GO** teaches a computer-readable recording medium having a simulation program recorded thereon for causing, in order to cause a computer to execute, based on design information of a design model designed in a virtual three-dimensional space, a simulation of working in the design model (Fig.14; Fig. 16D; Fig 15F;Col 4, Lines 23-24);

while one or more standard part models are arranged in the design model (Fig.2; Fig. 14; Col 4, Lines 24-28 and Col 4, Lines 37-49);

standard part model information, which indicates details of the one or more standard part models (Fig.2; Fig. 14; Col 4, Lines 24-28;, and Col 4, Lines 37-49).

GO does not expressly teach a computer-readable recording medium having a simulation program recorded thereon for causing, in order to cause a computer to execute a simulation of working with a working means model used to work the standard part models arranged in the design model. **SI** teaches a computer-readable recording medium having a simulation program recorded thereon for causing, in order to cause a computer to execute a simulation of working with a working means model used to work the standard part models arranged in the design model (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design

for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and 3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the computer-readable recording medium having a simulation program recorded thereon of **GO** with the computer-readable recording medium having a simulation program recorded thereon of **SI** that provided for causing, in order to cause a computer to execute a simulation of working with a working means model used to work the standard part models arranged in the design model, as fastener accessibility could be determined to evaluate a design for ease of disassembly and the information would allow evaluation of a product's disassemblability and optimization of the disassembly process.

GO does not expressly teach the computer to implement a function of providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models. **SI** teaches the computer to implement a function of providing working means model information, which indicates details of a working means model to be used in working on the one or more standard part models (Page 117-Page120, Para 2), as hands allow the user to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes (Page 117, Para 1 & 2) and behavior of tools need to be modeled to facilitate their use by the designer (Page 118, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the computer-readable recording medium having a simulation program recorded thereon of **GO** with the computer-readable recording medium having a simulation

program recorded thereon of **SI** that provided for the computer to implement a function of providing working means model information, which indicated details of a working means model to be used in working on the one or more standard part models, as that would allow the user's hands to manipulate the components in their virtual environment and representation of the designer in the virtual environment is one of the requirements in developing an environment for disassembly of virtual prototypes and behavior of tools need to be modeled to facilitate the use by the designer.

GO does not expressly teach the working means model information being linked with standard part model information. **SI** teaches the working means model information being linked with standard part model information (Page 128, Fig. 6.9), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the computer-readable recording medium having a simulation program recorded thereon of **GO** with the computer-readable recording medium having a simulation program recorded thereon of **SI** that included the working means model information being linked with standard part model information which indicates details of the one or more standard part models, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach the computer to implement a function of automatically acquiring the working means model information, which is to be linked with the working means model to be used in working on the individual standard part models used upon designing of a design model. **SI** teaches the computer to implement a function of automatically acquiring the

working means model information, which is to be linked with the working means model to be used in working on the individual standard part models used upon designing of a design model (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the computer-readable recording medium having a simulation program recorded thereon of **GO** with the computer-readable recording medium having a simulation program recorded thereon of **SI** that provided for the computer to implement a function of automatically acquiring the working means model information, which was to be linked with the working means model to be used in working on the individual standard part models used upon designing of a design model, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach the computer to implement a function of executing a simulation of working to be performed for the standard part models based on the acquired information of the working means model and a function of displaying a process of the execution of the simulation in a virtual three-dimensional space. **SI** teaches the computer to implement a function of executing a simulation of working to be performed for the standard part models based on the acquired information of the working means model and a function of displaying a process of the execution of the simulation in a virtual three-dimensional space (Fig. 6.6; Page 122, Sec. 6.2.3), as fastener accessibility could be determined to evaluate a design for ease of disassembly (Page 122, Sec. 6.2.3) and the information will allow evaluation of a product's disassemblability and optimization of the disassembly process (Page 127, Sec. 6.3.1, Items 1 and

3). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the computer-readable recording medium having a simulation program recorded thereon of **GO** with the computer-readable recording medium having a simulation program recorded thereon of **SI** that provided for the computer to implement a function of executing a simulation of working to be performed for the standard part models based on the acquired information of the working means model and a function of displaying a process of the execution of the simulation in a virtual three-dimensional space, as fastener accessibility could be determined to evaluate a design for ease of disassembly and the information would allow evaluation of a product's disassemblability and optimization of the disassembly process.

17.16 **As** per Claim 23, **GO** teaches designing supporting apparatus, comprising a standard part model information storage section for storing standard part model information regarding one or more standard part models standardized in advance based on a predetermined specification model (Fig.3A; Col 4, Lines 23-50 and Col 5, Lines 19-22);

a designing supporting section for arranging one or more standard part models to perform supporting for designing a subject in a virtual three-dimensional space (Col 1, Lines 10-13); and

a design data outputting section for outputting data regarding the subject designed in the virtual three-dimensional space and data regarding the attribute information extracted by the attribute information extraction section as design data (Fig.3B; Fig. 15F).

GO does not expressly teach the designing supporting [means] section including an attribute information extraction section for referring to the standard part model information storage section to automatically extract attribute information of a working means model to be

used to work the standard part models arranged in the subject designed in the virtual three-dimensional space. **SI** teaches the designing supporting [means] section including an attribute information extraction section for referring to the standard part model information storage section to automatically extract attribute information of a working means model to be used to work the standard part models arranged in the subject designed in the virtual three-dimensional space (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the designing supporting apparatus of **GO** with the designing supporting apparatus of **SI** that included the designing supporting [means] section including an attribute information extraction section for referring to the standard part model information storage section to automatically extract attribute information of a working means model to be used to work the standard part models arranged in the subject designed in the virtual three-dimensional space, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

GO does not expressly teach the attribute information including working means model information, which indicates details of a working means model to be used in working on the one or more standard part models and which is linked with the standard part model information. **SI** teaches the attribute information including working means model information, which indicates details of a working means model to be used in working on the one or more standard part models and which is linked with the standard part model information (Page 128, Fig. 6.9; Page 130, Fig. 6.11), as unfastening (fastening) refers to moving to the target fastener with appropriate tool and

then performing the unfastening (fastening) operation (Page 129, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the designing supporting apparatus of **GO** with the designing supporting apparatus of **SI** that provided for the attribute information including working means model information, which indicates details of a working means model to be used in working on the one or more standard part models and which is linked with the standard part model information, as unfastening (fastening) refers to moving to the target fastener with appropriate tool and then performing the unfastening (fastening) operation.

18. Claims 6, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Goto et al. (GO)** (U.S. Patent 5,075,866) in view of **Siddque (SI)** (Thesis for Master of Science, submitted to Georgia Tech, 1995), and further in view of **Hirata et al. (HR)** (U.S. Patent 6,157,902).

18.1 As per Claim 6, **GO** and **SI** teach the simulation apparatus of Claim 5. **GO** does not expressly teach that the interference checking section checks interference of the working means model including a route along which the working means model arrives at one of the standard part models when the standard part model arranged in the design model is worked using the working means model. **SI** teaches that that the interference checking section checks interference of the working means model when the standard part model arranged in the design model is worked using the working means model (Page 123, Sec. 6.2.4; Page 124, Fig. 6.7 and Para 2), as fastener accessibility needs to be determined to evaluate a design for ease of disassembly (Page 122, Sec.

6.2.3) and the information will allow evaluation of the product's disassemblability (Page 127, Sec. 6.3.1, Item 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** with the simulation apparatus of **SI** that included the interference checking section checking interference of the working means model when the standard part model arranged in the design model is worked using the working means model, as fastener accessibility needed to be determined to evaluate a design for ease of disassembly and the information would allow evaluation of the product's disassemblability.

GO and **SI** do not expressly teach that the interference checking section checks interference of the working means model including a route along which the working means model arrives at one of the standard part models when the standard part model arranged in the design model is worked using the working means model. **HR** teaches that that the interference checking section checks interference of a part in disassembly/assembly and remaining parts including a route along which the part arrives at other parts (Col 1, Lines 10-21; Col 2, Lines 23-36), as that would provide an automatic assembly/disassembly route producing system capable of simulating whether a designed product can actually be assembled or disassembled without actually manufacturing the product (Col 1, Lines 42-45). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation apparatus of **GO** and **SI** with the simulation apparatus of **HR** that included the interference checking section checking interference of a part in disassembly/assembly and remaining parts including a route along which the part arrives at other parts, and substituting for the part the working means model and for other part the standard part model, as that would provide an automatic

assembly/disassembly route producing system capable of simulating whether a designed product can actually be assembled or disassembled without actually manufacturing the product.

18.2 As per Claim 19, **GO** and **SI** teach the simulation method of Claim 13. **GO** and **SI** do not expressly teach that a process through which the working means model arrives at one of the standard part models which provides a subject position is displayed as the process of execution of the simulation of the working. **HR** teaches that a process through which the working means model arrives at one of the standard part models which provides a subject position is displayed as the process of execution of the simulation of the working (Col 1, Lines 10-17; Col 2 Lines 53-56; Col 13, Line 64 to Col 14, Line 4 and Col 16, Line 3-7), as that would provide an automatic assembly/disassembly route producing system capable of simulating whether a designed product can actually be assembled or disassembled without actually manufacturing the product (Col 1, Lines 42-45). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** and **SI** with the simulation method of **HR** that provided for a process through which the working means model arrived at one of the standard part models which provided a subject position being displayed as the process of execution of the simulation of the working, as that would provide an automatic assembly/disassembly route producing system capable of simulating whether a designed product could actually be assembled or disassembled without actually manufacturing the product.

GO does not expressly teach that a manner of working performed based on a condition defined in advance for the working means model is displayed as the process of execution of the simulation of the working. **SI** teaches that a manner of working performed based on a condition

defined in advance for the working means model is displayed as the process of execution of the simulation of the working (Page 120, Para 2 & 3; Fig 6.6), as from the simulation, the accessibility and relative difficulty of unfastening (fastening) can be determined by the designer (Page 123, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** with the simulation method of **SI** that provided for a manner of working performed based on a condition defined in advance for the working means model being displayed as the process of execution of the simulation of the working, as from the simulation, the accessibility and relative difficulty of unfastening (fastening) could be determined by the designer.

18.3 As per Claim 20, **GO, SI** and **HR** teach the simulation method of Claim 19. **GO** and **SI** do not expressly teach that after the working performed based on the condition defined in advance for the working means model is completed, a process through which the working means model is spaced away from the subject position based on a condition defined in advance for the standard part models is displayed. **HR** teaches that after the working performed based on the condition defined in advance for the working means model is completed, a process through which the working means model is spaced away from the subject position based on a condition defined in advance for the standard part models is displayed (Col 2, Lines 61-67; Col 16, Line 3-7), as from the simulation, the accessibility and relative difficulty of unfastening (fastening) can be determined by the designer (**SI**: Page 123, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** and **SI** with the simulation method of **HR** that provided for after the working performed

based on the condition defined in advance for the working means model was completed, a process through which the working means model was spaced away from the subject position based on a condition defined in advance for the standard part models was displayed, as from the simulation, the accessibility and relative difficulty of unfastening (fastening) could be determined by the designer.

GO and **SI** do not expressly teach that after the working means model is spaced by a predefined distance away from the subject position, the display of the working means model or the working means model and the standard part models is erased. **HR** teaches that after the working means model is spaced by a predefined distance away from the subject position, the display of the working means model or the working means model and the standard part models is erased (Col 2, Lines 61-67; Col 16, Line 3-7), as from the simulation, the accessibility and relative difficulty of unfastening (fastening) can be determined by the designer (**SI**: Page 123, Para 1). It would have been obvious to one of ordinary skill in the art at the time of Applicant's invention to modify the simulation method of **GO** and **SI** with the simulation method of **HR** that provided for after the working means model was spaced by a predefined distance away from the subject position, the display of the working means model or the working means model and the standard part models was erased, as from the simulation, the accessibility and relative difficulty of unfastening (fastening) could be determined by the designer.

Allowable Subject Matter

19. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's Arguments

20. The applicant argues the following:

(1) Sato neither teaches nor suggests automatic working means/tool extraction feature. Carver does not suggest or add this feature; and

(2) the 103 rejections propose motives for combining prior art references. The motives are improper because they are not found in the prior art.

Examiner's reply

21. As per the applicant's arguments, the applicant's attention is requested to the corresponding claim rejections. In addition, the following explanation is provided to further explain the examiner's position.

21.1 In response to the applicant's argument that Sato neither teaches nor suggests automatic working means/tool extraction feature and Carver does not suggest or add this feature, the examiner has used a new reference (**SI**).

21.2 In response to the applicant's argument that the 103 rejections propose motives for combining prior art references and the motives are improper because they are not found in the prior art, the examiner has cited the motives for combining the prior art that are found in the prior art.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure.

The following patents are cited to further show the state of the art with respect to virtual assembly/disassembly in virtual three-dimensional environment.

1. Goto et al., "Apparatus for automatically designing jig", U.S. Patent 5,075,866, December 1991.
2. Siddique, "Conversion of CAD model data for virtual prototypes for Disassembly", Thesis to The Academic faculty for Master of Science in Mechanical Engineering, Georgia Institute of Technology, May 1996.

ACTION IS FINAL

23. Applicant's arguments with respect to claim rejections under 35 USC § 112 first paragraph are not persuasive. Additional rejections 35 U.S.C. 112 first paragraph and

second paragraph have been necessitated by the amended claims. Applicant's arguments with respect to claim rejections under 35 U.S.C. 102 (b) and under 35 U.S.C. 103 (a) are moot in view of the new ground(s) of rejection which are applied against the amended claims. The applicant's amendments necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-746-7329.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
October 18, 2002

SAMUEL BRODA, ESQ.
PATENT EXAMINER